

FIG.1

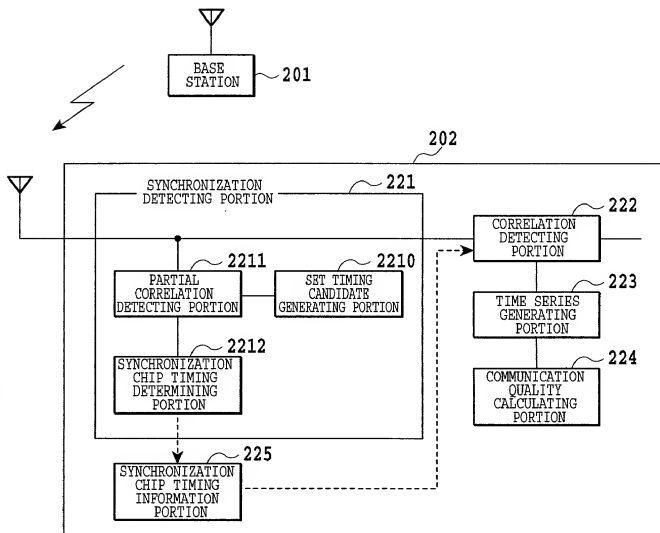


FIG.2

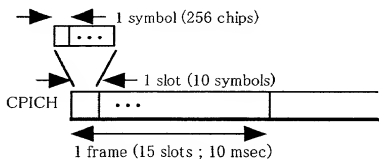


FIG.3

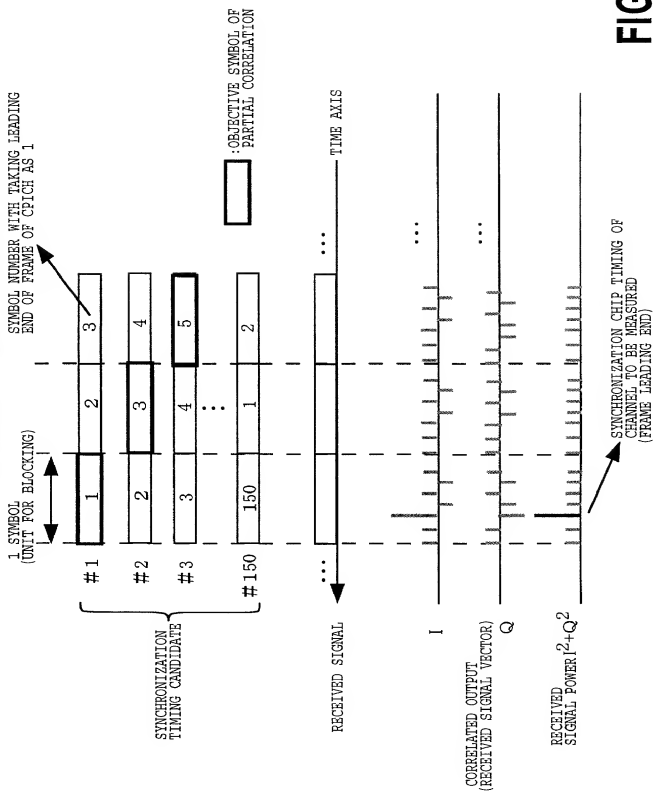


FIG.4



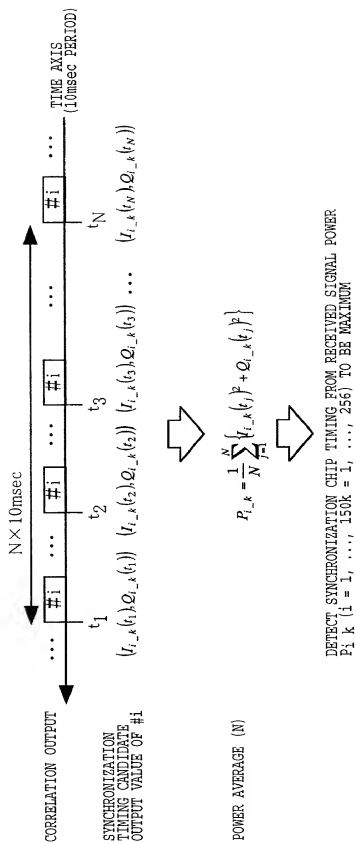


FIG. 7

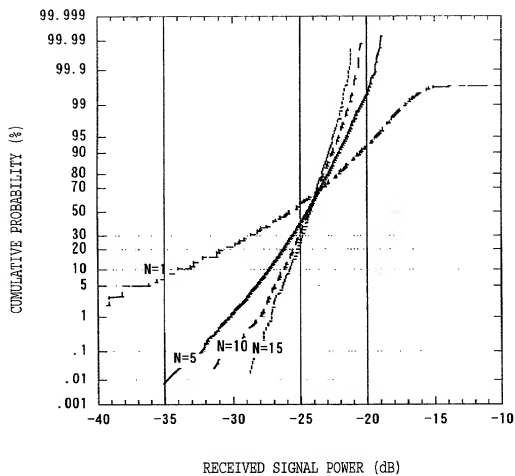


FIG.8

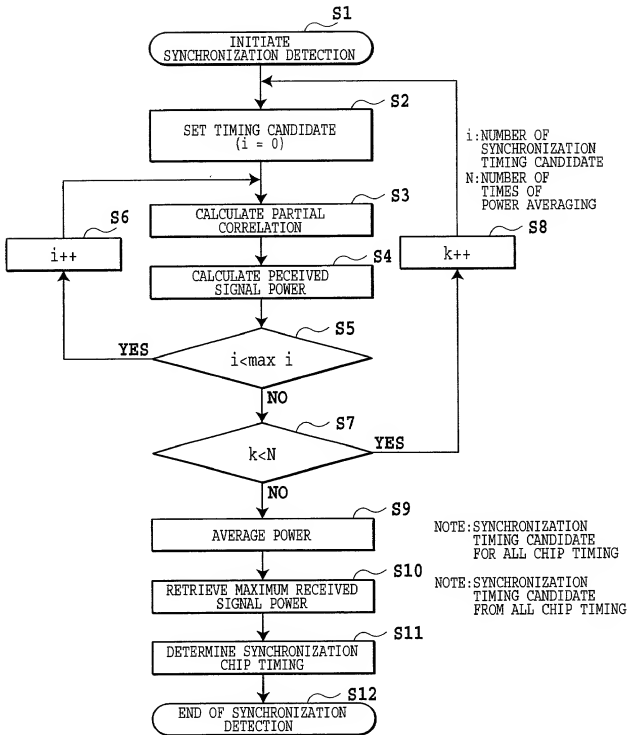


FIG.9

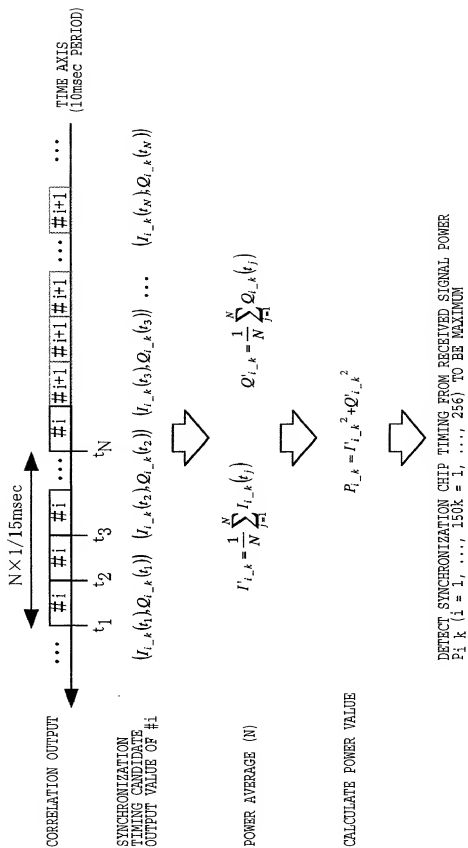


FIG.10

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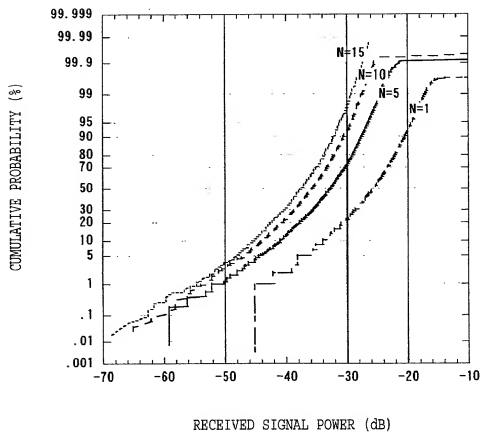


FIG.11

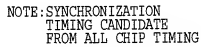


FIG.12

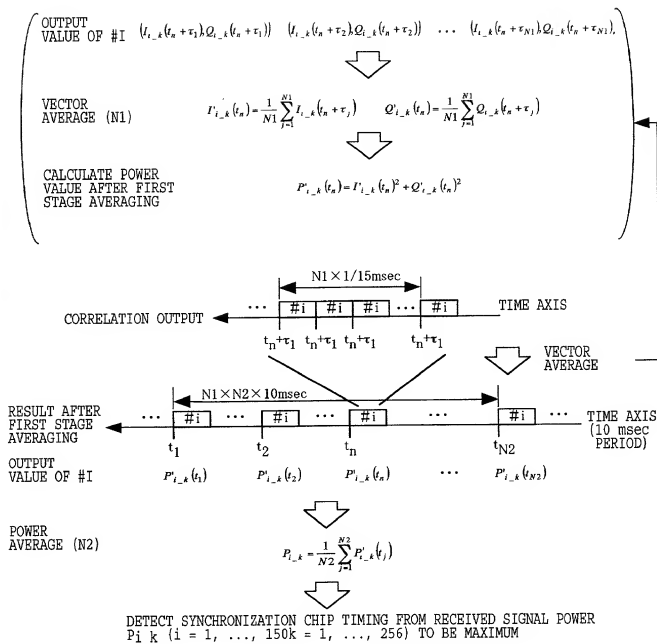


FIG.13

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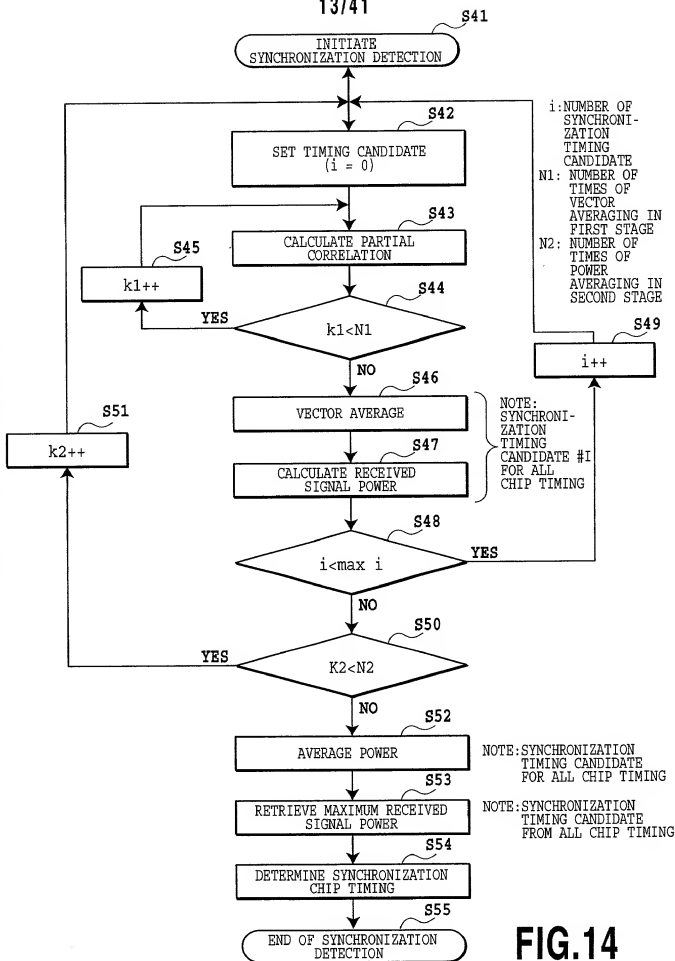
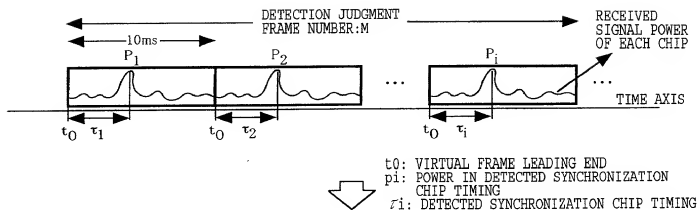


FIG.14



CALCULATE FOR JUDGMENT

AVERAGE VALUE OF
SYNCHRONIZATION CHIP TIMING

$$T_m = \frac{\sum_{i=1}^M P_i \cdot \tau_i}{\sum_{i=1}^M P_i}$$

STANDARD DEVIATION OF
SYNCHRONIZATION CHIP TIMING

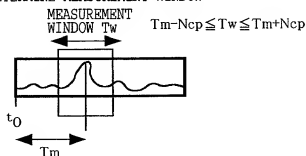
$$T_s = \sqrt{\frac{\sum_{i=1}^M P_i \cdot (\tau_i - T_m)^2}{\sum_{i=1}^M P_i}}$$

DETECTION JUDGMENT

$t_s \leq N_{cp}$ → A DETECTION SUCCESSFUL
 $t_s > N_{cp}$ → A DETECTION FAILED

- START MEASUREMENT BY MEASUREMENT WINDOW SHOWN IN RIGHT SIDE WHEN DETECTION SUCCESSFUL
- PERFORM SYNCHRONIZATION DETECTION AGAIN WHEN DETECTION FAILED

DETERMINE MEASUREMENT WINDOW



NOTE: DEFINITION OF NCP
 MEASURE 256 CHIPS BY MEASURING PORTION
 $N_{cp} = 256/2$
 MEASURE 512 CHIP
 $N_{cp} = 512/2$

FIG.15

FRAME CONFIGURATION OF CPICH UPON USE OF TRANSMIT DIVERSITY

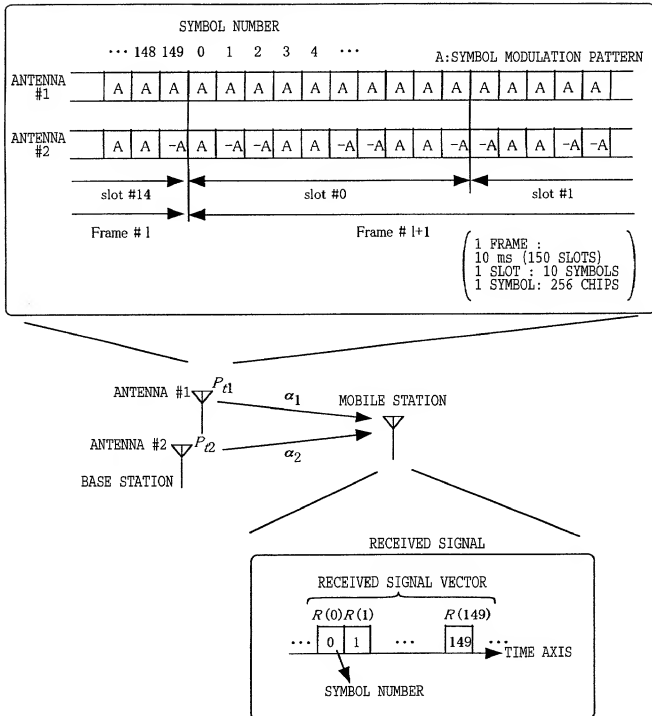
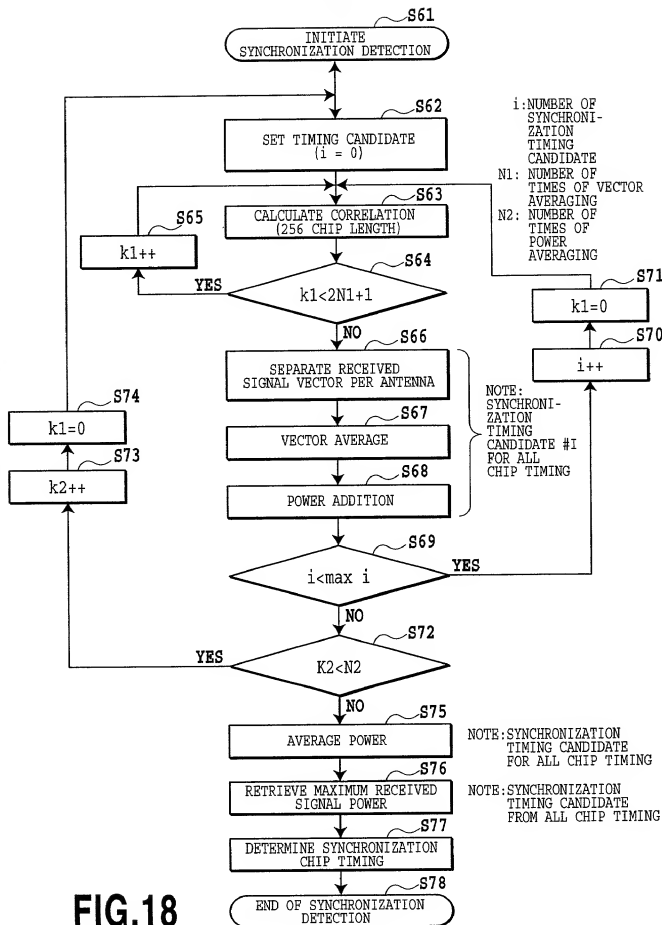


FIG.16





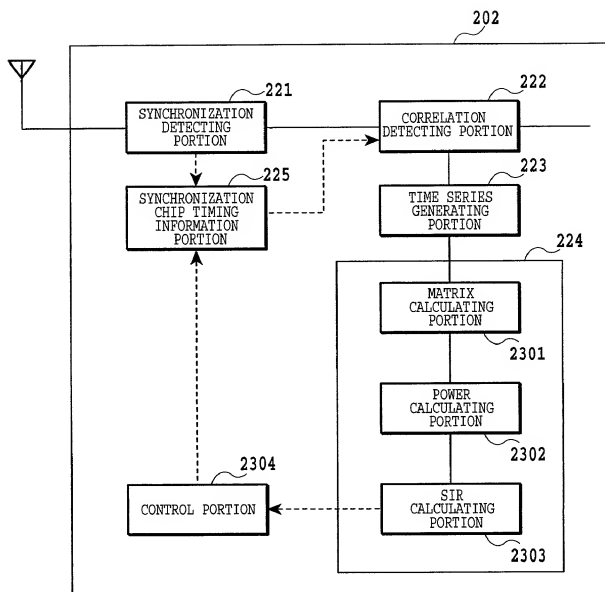
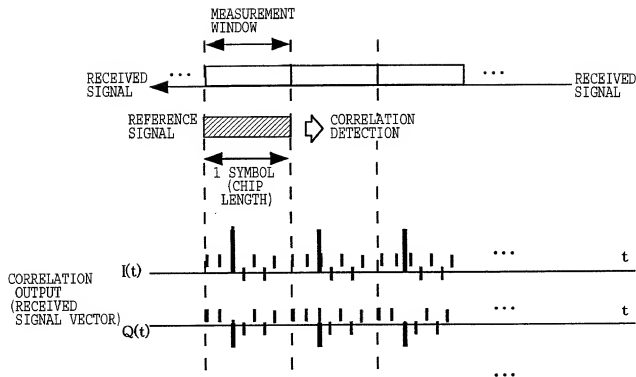


FIG.19



THE SAME RECEPTION CHIP TIMING

$$\text{RECEIVED SIGNAL VECTOR OF CHIP TIMING } k \begin{cases} \text{SERIES 1 } \mathbf{r}_{-k}(t) = I_{-k}(t) + jQ_{-k}(t) \\ \text{SERIES 2 } \mathbf{r}_{-k}(t + n\Delta\tau) = I_{-k}(t + n\Delta\tau) + jQ_{-k}(t + n\Delta\tau) \text{ WHEREIN } \Delta\tau \text{ IS } 1 \text{ SYMBOL PERIOD} \end{cases}$$

$$\text{COVARIANT MATRIX OF SERIES 1 AND 2} \quad R_{rr} = \begin{bmatrix} \langle \mathbf{r}_{-k}(t) \cdot \mathbf{r}_{-k}^H(t) \rangle & \langle \mathbf{r}_{-k}(t) \cdot \mathbf{r}_{-k}^H(t + n\Delta\tau) \rangle \\ \langle \mathbf{r}_{-k}(t + n\Delta\tau) \cdot \mathbf{r}_{-k}^H(t) \rangle & \langle \mathbf{r}_{-k}(t + n\Delta\tau) \cdot \mathbf{r}_{-k}^H(t + n\Delta\tau) \rangle \end{bmatrix} \Rightarrow \begin{matrix} \text{EIGENVALUE} \\ \lambda_1, \lambda_2 \quad (\lambda_1 > \lambda_2) \end{matrix}$$

CHIP TIMING k

DESIRED SIGNAL POWER

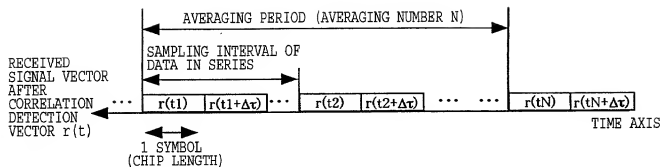
$$P_{S_{-k}} = \frac{\lambda_1 - \lambda_2}{2}$$

$$P_{I_{-k}} = \lambda_2$$

INTERFERENCE SIGNAL POWER

(WHEREIN $N\Delta\tau$ IS SUFFICIENTLY SHORT PERIOD FOR FLUCTUA)

FIG.20



RECEIVED SIGNAL VECTOR OF CHIP TIMING $r_k(t1)$

SERIES 1 $r_{k}(t1) \quad r_{k}(t2) \quad \dots \quad r_{k}(tN)$

SERIES 2 $r_{k}(t1+\Delta\tau) \quad r_{k}(t2+\Delta\tau) \quad \dots \quad r_{k}(tN+\Delta\tau)$

ADD VECTOR : $\alpha_k(t) = r_k(t) + r_k(t+\Delta\tau)$

DIFFERENCE VECTOR: $\beta_k(t) = r_k(t) - r_k(t+\Delta\tau)$

CHIP TIMING k

DESIRED SIGNAL POWER

$$P_{s,k} = \frac{|P'_{s,k} - P_{I,k}|}{2}$$

INTERFERENCE SIGNAL POWER

$$P_{I,k} = \frac{1}{N} \sum_{j=1}^N \frac{|\beta(t_j)|^2}{2}$$

WHEREIN

$$P'_{s,k} = \frac{1}{N} \sum_{j=1}^N \frac{|\alpha(t_j)|^2}{2}$$

FIG.21

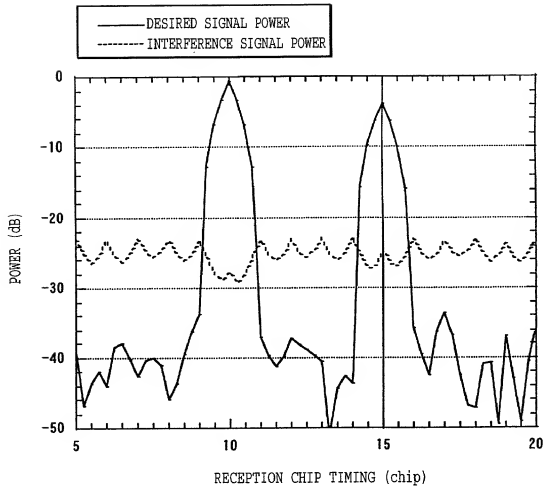


FIG.22

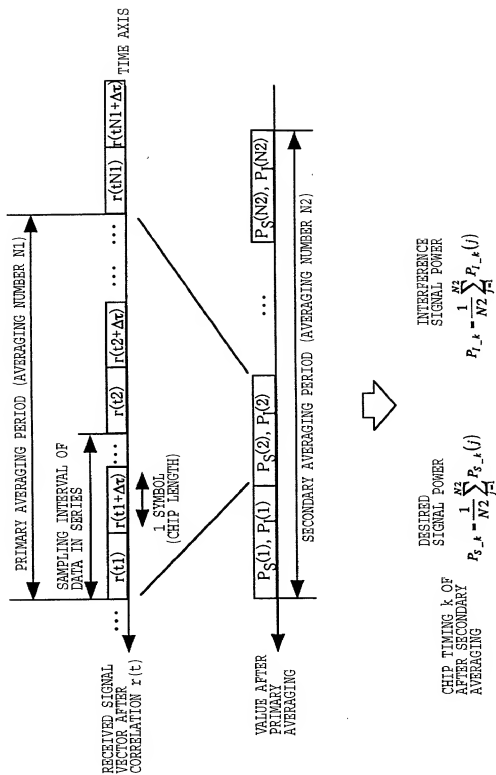


FIG.23



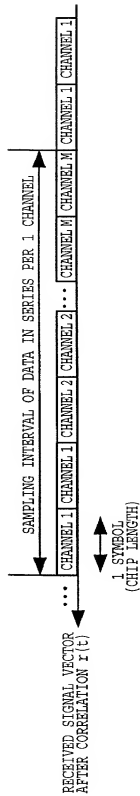


FIG.25

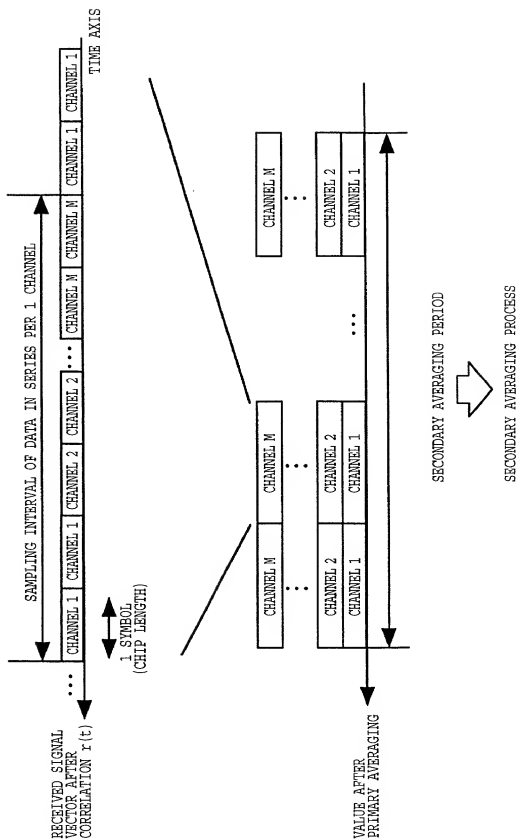


FIG.26

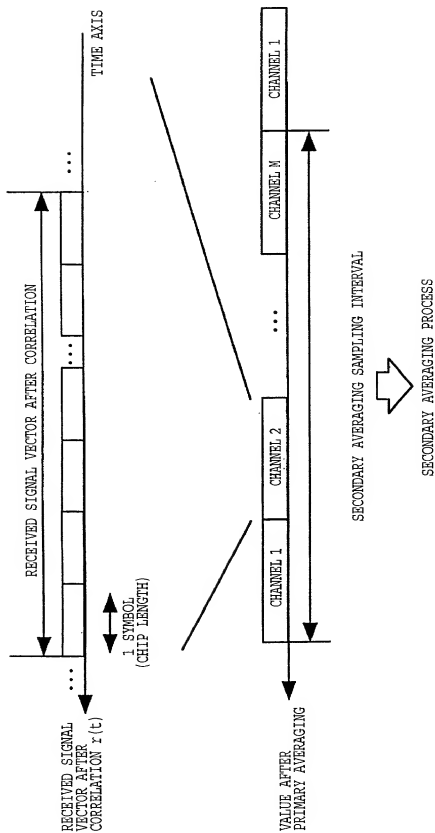


FIG.27

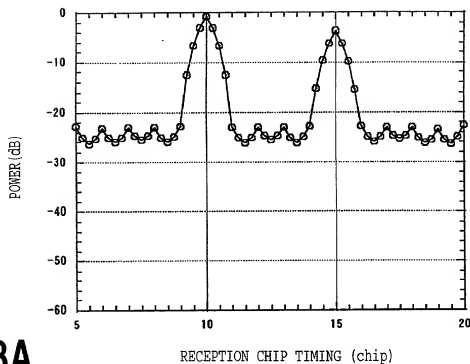


FIG.28A

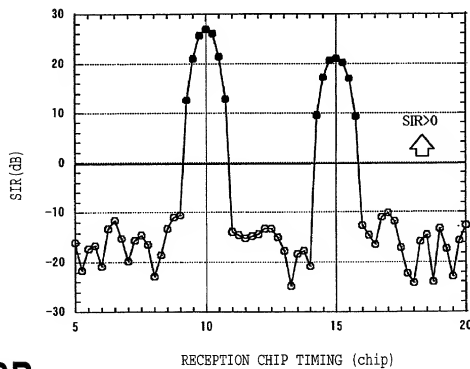
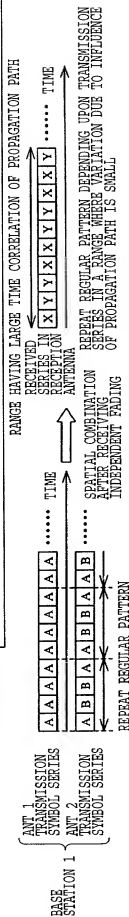
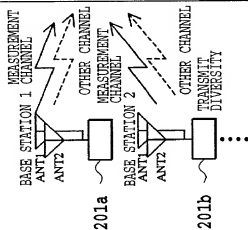
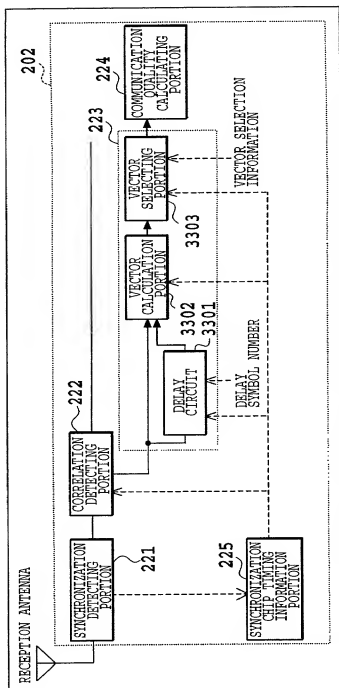
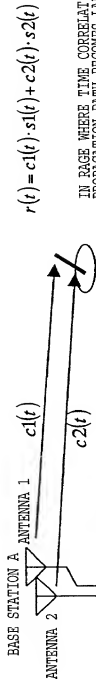
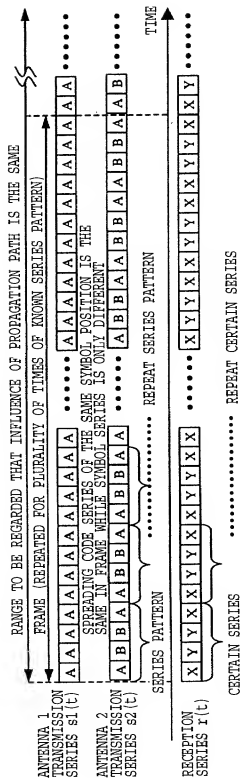


FIG.28B



※ A, B ARE TRANSMISSION SYMBOLS AND X, Y ARE RECEPTION SYMBOLS

FIG.29



IN RANGE WHERE TIME CORRELATION OF $c_1(t) = c_1$
PROPAGATION PATH BECOMES LARGE,
 $c_1(t)$ AND $c_2(t)$ CAN BE REGARDED
AS CONSTANT

IN RANGE WHERE TIME CORRELATION OF
PROPAGATION PATH BECOMES LARGE

WHEN TRANSMISSION SYMBOL
(ANTENNA 1, ANTENNA 2) = (A, A)

$$r(t) = c_1 \cdot A + c_2 \cdot A = (c_1 + c_2) \cdot A = Y$$

WHEN TRANSMISSION SYMBOL
(ANTENNA 1, ANTENNA 2) = (A, B)

$$r(t) = c_1 \cdot A + c_2 \cdot B = (c_1 + c_2 \cdot B/A) \cdot A = X$$

FIG.30

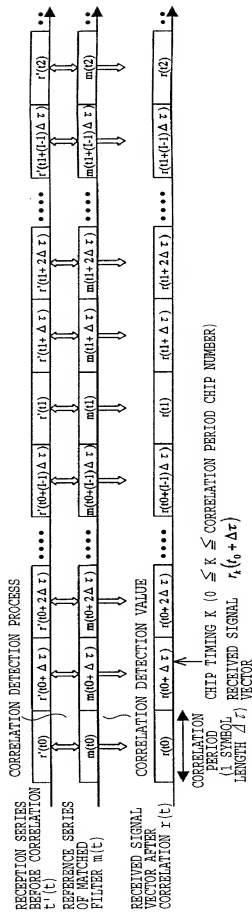


FIG.31

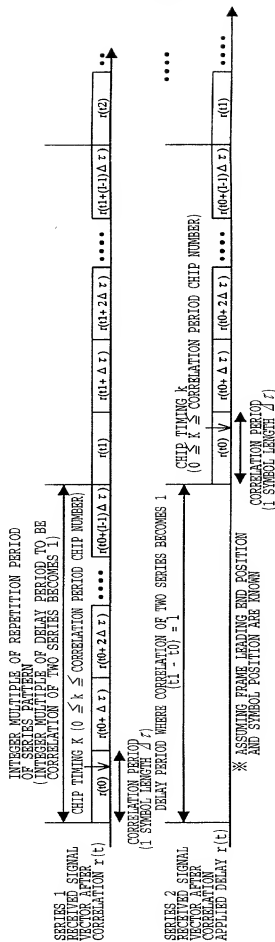
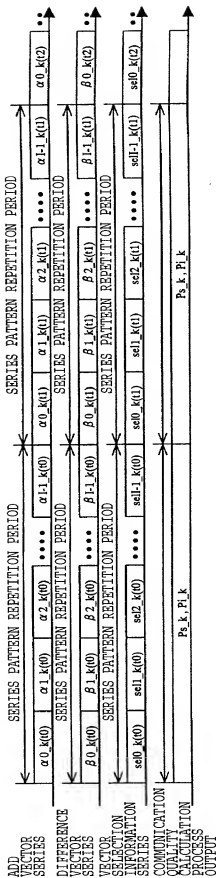


FIG.32



ADD VECTOR AFTER SELECTION $\alpha'_{i,k}(t_j) = sel_{i,k}(t_j) \cdot \alpha_{i,k}(t_j)$
 DIFFERENCE VECTOR AFTER SELECTION $\beta'_{i,k}(t_j) = sel_{i,k}(t_j) \cdot \beta_{i,k}(t_j)$

VECTOR SELECTION INFORMATION $\begin{cases} sel_{i,k}(t_j) = 1 & \text{SELECTION ON} \\ sel_{i,k}(t_j) = 0 & \text{SELECTION OFF} \end{cases}$

$$\text{DESIRED SIGNAL POWER } P_{s,k} = \frac{|P_{s,k} - P_{l,k}|}{2}$$

$$\text{INTERFERENCE SIGNAL POWER } P_{l,k} = \frac{1}{N} \sum_{j=1}^{N-1} |\beta'_{i,k}(t_j)|^2$$

WHEREIN $P'_{s,k} = \frac{1}{N} \sum_{j=1}^{N-1} \frac{|\alpha'_{i,k}(t_j)|^2}{2}$

I IS DELAY SYMBOL NUMBER
 J IS SERIES PATTERN REPETITION NUMBER OF AVERAGING RANGE
 N IS SELECT ON NUMBER IN AVERAGING RANGE

※ WHEN AVERAGING PERIOD IN COMMUNICATION QUALITY CALCULATION PROCESS IS SERIES PATTERN REPETITION PERIOD

FIG.34

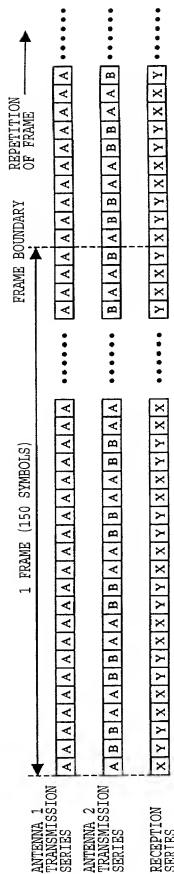
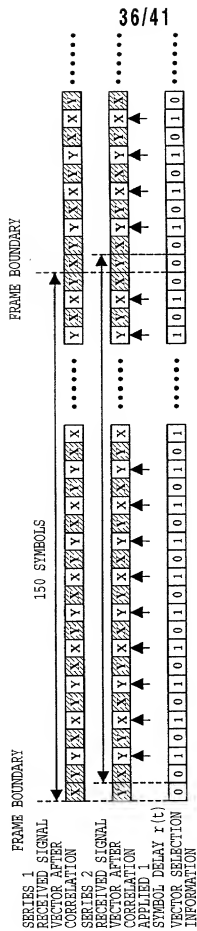


FIG.35



✱ CORRESPONDS VECTOR INFORMATION 1 AND IS SYMBOL TRANSMITTED IN SELECTED COMMUNICATION QUALITY CALCULATION PROCESS

FIG. 37

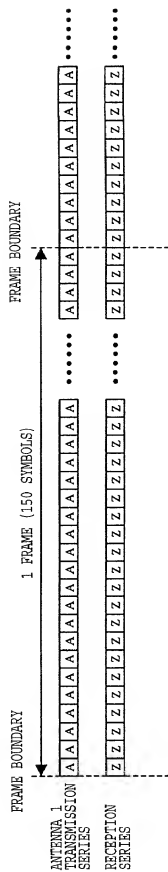


FIG.38

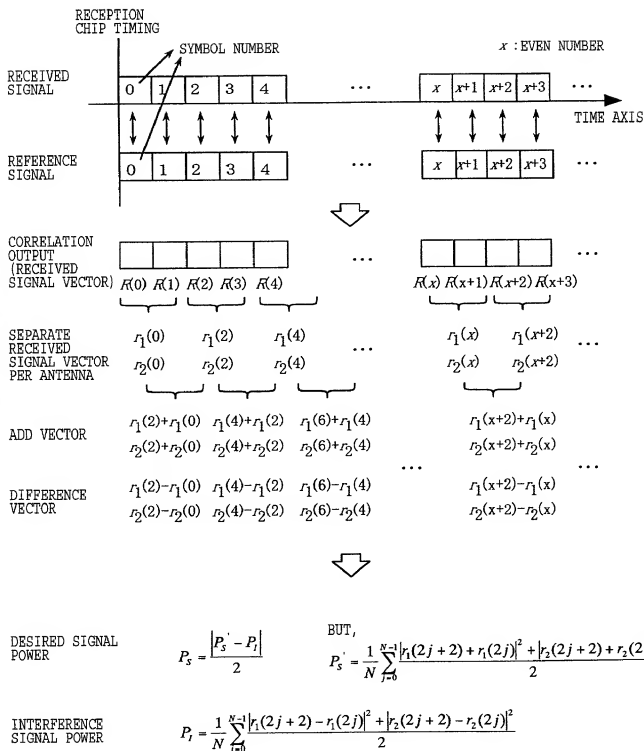


FIG.39

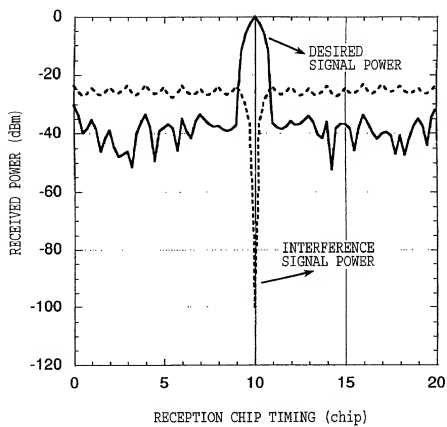
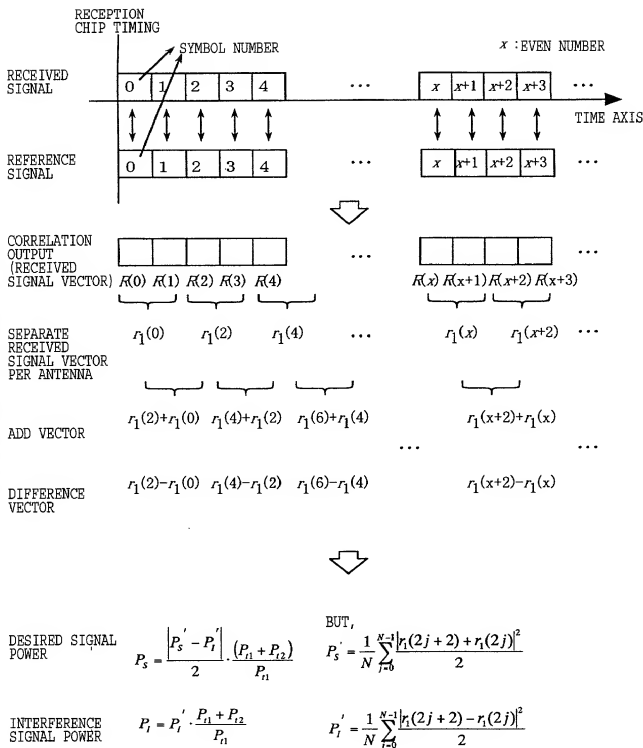


FIG.40



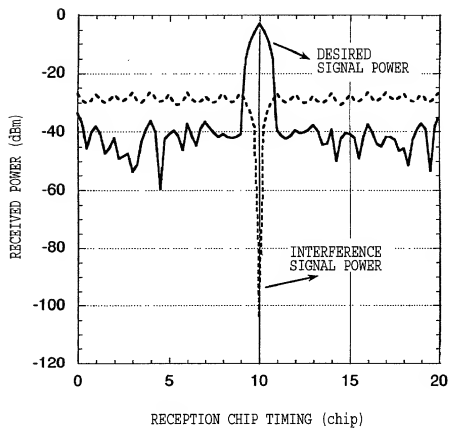


FIG.42